REMARKS

Claims 1-2, 4-8, 10-14, 16-17, 19-21, 23-24, 26-28, and 31-34 are now pending in the application. Claims 3, 9, 15, 18, 22, 25, 29, 29 and 30 have been canceled without prejudice or disclaimer. Claims 1, 7, 13, 14, 16, 17, 19, 21, 23, 24, 26, and 28 have been amended, and new claims 31-34 added, without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claims 1-30 stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Oh et al. (US Pub. No. 2004/0137,860 -- henceforth "Oh"). This rejection is respectfully traversed.

The rejection of claims 3, 9, 15, 18, 22, 25, 29, and 30 has been rendered moot by the cancellation of these claims without prejudice or disclaimer.

Before addressing the rejection, it is noted that a number of amendments have been made, as follows:

Independent method claim 1 has been amended to further define the subject matter previously defined by dependent claim 3. Claim 3 has therefore been canceled. Claim 1 has also been amended to even more clearly define that the block error rate (BLER) that is determined is one that "corresponds to a first transport channel." Support for this amendment can be found in the specification, for example, at paragraphs 51 through 53 in conjunction with Figures 5 and 6, and also in original claim 1 which recited "... the BLER and a target BLER for the first transport channel."

Independent apparatus claim 7 has been similarly amended, with the subject matter of claim 9 being incorporated into claim 7 and claim 9 consequently being canceled without prejudice or disclaimer.

Independent method claim 13 has been amended to clarify that "determining a common BLER of data blocks received on a plurality of transport channels" is "determining common error rate information based on a plurality of individual error rate information received on respective ones of a plurality of transport channels; [and] determining a common block error rate (BLER) based on the common error rate information." Independent apparatus claim 14 has been similarly amended. Support for these amendments can be found in the application at, for example, blocks 630, 640 and 650 in Fig. 6A and supporting text. (Support for the term "error rate information" can be found, for example, in original claim 3.)

Each one of claims 16, 19, and 21 has been rewritten in independent form including all of the limitations of the base claim (claim 15) and any intervening claims (none). The base claim 15 has been canceled without prejudice or disclaimer.

Each one of claims 23, 26, and 28 has been rewritten in independent form including all of the limitations of the base claim (claim 22) and any intervening claims (none). The base claim 22 has been canceled without prejudice or disclaimer.

To facilitate an appreciation for the various inventive aspects defined by the claims, a brief general discussion of the invention will first be presented.

Mobile communications systems such as the exemplary code division multiple access (CDMA) systems described in the application enable a plurality of users to share the same radio resource within a geographical area. It is important, in such systems, that each physical channel not use more power than necessary. This is achieved by a transmit power control mechanism in which the terminal estimates the signal-to-interference ratio (SIR) for its dedicated physical channel, compares the estimated SIR against a reference value, and informs the base station to adjust the base station's transmitted power on that physical channel to an appropriate level. In particular, to achieve reliable reception of a signal at each user equipment (UE), the SIR of the received signal should exceed a prescribed threshold for each UE.

To improve the SIR of a received signal, the power of the transmitted signal may be increased, depending on the SIR measured at the receiver. Power, however, is an important resource in CDMA (as well as other) systems. Since different channels are transmitting simultaneously at the same frequency, it is important to keep the power level on each physical channel as low as possible while still maintaining an acceptable error rate of the received blocks of user data on the transport channel, that is, block error rate (BLER).

As further explained in the Background section of the instant application, downlink power control can be logically divided into an "inner loop" and an "outer loop," where the inner loop controls the SIR by sending transmission power control commands to the base station and the outer loop controls the quality, in terms of BLER, by providing SIR references to the inner loop.

Conventional power control techniques compute one SIR reference for each transport channel, based on the BLER and the BLER reference for that transport channel, and the maximum of these SIR references is used by the inner loop.

The objective of outer loop power control is to keep the BLER on each transport channel below their BLER reference while minimizing the power demands. A problem with conventional power control methods is that the convergence of the SIR reference is slow when the number of received blocks over a given TTI, i.e., the block rate (BLR), on the transport channel is low. This occurs because the controller is updated less and less frequently as the BLR decreases, resulting in slower convergence. Slower convergence results in poor channel quality or higher than necessary power demands. It is especially problematic when the SIR reference is far from the correct level, since either the BLER or the power level will remain too high over an extended period of time, thus reducing system capacity. A typical situation where the SIR reference is too high is at initialization, where a high SIR reference is used to guarantee reception of the first data blocks.

In order to address the shortcomings of conventional methods, convergence time at low BLRs must be reduced. A transport channel with a reduced BLR will have a proportionally reduced rate of information about the BLER available. Applicant accordingly describes and claims various ways to compensate for this reduction of information by using information from other transport channels and/or by taking steps to increase confidence in the available information. More particularly, according to exemplary embodiments, instead of considering only error rate information for each transport channel individually, convergence time is improved by considering other information, such as quality information from other transport channels and block rate information for the channel to determine an SIR_{ref} to be used for power control. By considering such other information, an improved outer loop power control is achieved, thus reducing the power needed for the physical channel and increasing the capacity of the communication system.

These aspects are reflected in the variously claimed embodiments. For example, independent claim 1 defines a "method for controlling power in a communication system, comprising determining a block error rate (BLER) corresponding to a first transport channel based on data blocks received on the first transport channel and data blocks *of at least a second transport channel*; and determining a reference signal-to-interference (SIR) value corresponding to the first transport channel based on the BLER and a target BLER for the first transport channel, wherein error rate information corresponding to the data blocks of the at least second transport channel is weighted according to at least one of channel coding, a code rate, rate matching, and a current SIR of the first and second transport channels."

Independent claim 7 similarly defines an apparatus having corresponding features.

Thus, the subject matter defined by independent claims 1 and 7 involves determining the BLER for a transport channel based on blocks from many transport channels. This is neither disclosed nor suggested by the Oh document.

Independent claim 13 defines "a method for controlling power in a communication system, comprising: determining common error rate information based on a plurality of individual error rate information received on respective ones of a plurality of transport channels; determining a common block error rate (BLER) based on the common error rate information; determining a common target BLER based on individual target block error rates for the plurality of transport channels; and determining a reference signal-to-interference ratio (SIR) value corresponding to the plurality of transport channels based on the common BLER and the common target BLER, said reference SIR being used for controlling power."

Independent claim 14 similarly defines an apparatus having corresponding features.

Thus, the subject matter defined by independent claims 13 and 14 involve determining a common BLER for a number of transport channels based on blocks received on those channels. This feature is neither disclosed nor suggested by the Oh document.

Independent claims 16, 19, and 21 are each directed to "A method for controlling power in a communication system", which methods include, *inter alia*, "determining a BLER of data blocks received on a transport channel; estimating a block rate (BLR) of the data blocks received on the transport channel; [and] determining a reference SIR value corresponding to the transport channel based on the BLER, a target BLER, and the estimated BLR, said reference SIR being considered for controlling power."

Independent claims 23, 26, and 28 similarly define apparatuses having corresponding features.

In each of these embodiments, a BLER and BLR are determined, and based on these plus the BLER target the SIR target is determined. This feature is neither disclosed nor suggested by the Oh document.

The Office's reliance on Oh is inapposite at least because Oh does not disclose the features discussed above, in which, instead of considering only error rate information for each transport channel individually, convergence time is improved by considering other information, such as quality information from other transport channels and block rate information for the channel to determine an SIR_{ref} to be used for power control. For example, paragraph 0027 of Oh specifically states that "Each transport channel may further be

associated with a respective SIR target that is dependent on (1) the target BLER specified *for that transport channel*, ..."

To take another example, Oh's paragraph 0036 states that "The final SIR target for the physical channel is then determined based on the SIR targets for the transport channels." No mention is made whatsoever of, for example, "determining a block error rate corresponding to a first transport channel based on data blocks received on the first transport channel *and data blocks of at least a second transport channel*."

To take yet another example, paragraph 0101 of Oh mentions merely that "W-CDMA currently permits one target BLER to be specified for each transport channel .... In this case, the outer loop may be operated to maintain an SIR target for each transport format of each transport channel. The SIR target for each transport channel may then be determined based on the SIR targets for all transport formats of that transport channel. The SIR target fort the physical channel may then be determined based on the SIR targets for all transport channels. ..."

It is well established that "'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' [citation omitted]." MPEP §2131, page 2100-67. In this case, Oh not only fails to anticipate Applicants' variously claimed embodiments, but it also fails to suggest any of the claimed embodiments because of its complete silence with respect to the various features discussed above.

For at least the foregoing reasons, the independent claims 1, 7, 13, 14, 16, 19, 21, 23, 26, and 28 are believed to define subject matter that is patentably distinguishable over that which is disclosed by Oh. The remaining dependent claims 2, 4-6, 8, 10-12, 17, 20, 24, and 27 inherit the features defined by their respective base claims, and therefore define subject matter that is patentably distinguishable over Oh for at least the same reasons as set forth above.

It is therefore respectfully requested that the rejection of claims 1-2, 4-8, 10-14, 16-17, 19-21, 23-24, and 26-28 under 35 U.S.C. §102(e) be withdrawn.

New dependent claims 31-34 have been added to the application without introduction of new matter. Support for these claims can be found in the specification at, for example, paragraph 0058 and block 630 in Fig. 6A. These claims are believed to define patentable subject matter at least because of their respective dependence from what Applicants consider to be allowable claims.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,

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